

Claims

Sub A 1
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What is claimed is:

1. A method for etching a feature in an integrated circuit wafer, the wafer incorporating at least one low-k dielectric layer, the method comprising:
 - disposing the wafer within a reaction chamber;
 - introducing a flow of fluorocarbon-containing etchant gas into the reaction chamber;
 - forming a plasma from the etchant gas within the reaction chamber; and
 - etching the feature in at least a portion of the low-k dielectric layer.
2. The method, as recited in claim 1, wherein the low-k dielectric layer is an organic low-k dielectric layer.
- 15 3. The method, as recited in claim 2, wherein the fluorocarbon is selected from(a) group consisting of CH_3F , CH_2F_2 , and CHF_3 .
- 20 4. The method, as recited in claim 3, wherein the fluorocarbon-containing etchant gas further contains additives selected from the group consisting of oxygen, hydrogen, nitrogen, and ammonia.
- 25 5. The method, as recited in claim 4, wherein the organic dielectric layer is made of SiLK.
Sub A 2
6. The method, as recited in claim 5, wherein the fluorocarbon has a flow rate, wherein the flow rate of the fluorocarbon is between 0.5 sccm and 50 sccm.
- 30 7. The method, as recited in claim 2, wherein the organic dielectric layer is made of SiLK.
Sub A 3
8. The method, as recited in claim 7, wherein the fluorocarbon-containing etchant gas comprises CH_3F gas, H_2 gas, and N_2 gas.
- 35 9. The method, as recited in claim 7, wherein the fluorocarbon-containing etchant gas comprises CH_3F gas and NH_3 gas.
10. The method, as recited in claim 7, wherein the fluorocarbon-containing etchant gas comprises CH_3F gas, O_2 gas, and N_2 gas.

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11. The method, as recited in claim 5, wherein the fluorocarbon has a flow rate, wherein the flow rate of the fluorocarbon is between 0.5 sccm and 50 sccm.

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12. The method, as recited in claim 2, wherein the fluorocarbon-containing etchant gas comprises CH₃F gas, H₂ gas, and N₂ gas.

13. The method, as recited in claim 2, wherein the fluorocarbon-containing etchant gas comprises CH₃F gas and NH₃ gas.

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14. The method, as recited in claim 2, wherein the fluorocarbon-containing etchant gas comprises CH₃F gas, O₂ gas, and N₂ gas.

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15. An integrated circuit on a wafer, wherein the integrated circuit has a feature formed in at least one low-k dielectric layer, wherein the feature is etched by the method, comprising:

disposing the wafer within a reaction chamber;
striking a plasma within the reaction chamber;
introducing a flow of fluorocarbon-containing etchant gas into the reaction chamber; and

with the plasma and the etchant gas in operative combination, etching the feature in at least a portion of the low-k dielectric layer.

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16. The integrated circuit, as recited in claim 15, wherein the low-k dielectric layer is an organic low-k dielectric layer.

17. The integrated circuit, as recited in claim 16, wherein the fluorocarbon is selected from a group consisting of CH₃F, CH₂F₂, and CHF₃.

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18. The integrated circuit, as recited in claim 17, wherein the fluorocarbon-containing etchant gas further contains additives selected from the group consisting of oxygen, hydrogen, nitrogen, and ammonia.

(Add B1)